

WE CLAIM:

1. An architecture for intercepting and processing packets transmitted from a source to a destination over a network, the architecture comprising:
 - a packet interceptor coupled with said network and operative to selectively intercept said packets prior to receipt by said destination;
 - at least one primary processor coupled with said packet interceptor and operative to perform primary processing tasks on said intercepted packets, said at least one stateless processor including:
 - at least two primary packet processors coupled in parallel, said processing of said intercepted packets being distributed among said at least two primary packet processors;
 - at least one secondary processor coupled with said at least one stateless processor and operative to perform stateful processing tasks on said intercepted packets, said at least one secondary processor including:
 - at least two secondary packet processors coupled in series with each other, each of said at least two secondary packet processors operative to perform a portion of said stateful processing tasks on said intercepted packets, a last one in said series of said at least two secondary packet processors being coupled with said network and operative to selectively release said intercepted packet back to said network.
2. The architecture of Claim 1, wherein said network further comprises a bi-directional network having an upstream flow and a downstream flow, said architecture further comprising at least two of said at least one primary processor and at least two of said at least one secondary processor, a first of said at least two primary and secondary processors being coupled with said upstream flow and a second of said at least two primary and secondary processors being coupled with said downstream flow.

3. The architecture of Claim 2, wherein said at least two secondary processors are capable of sharing state information between each other.
4. The architecture of Claim 1, wherein said at least two primary packet processors are coupled together and operative to share data.
5. The architecture of Claim 4, wherein said at least two primary packet processors are coupled together with at least one co-processor.
6. The architecture of Claim 5, wherein said co-processor comprises a classification co-processor.
7. The architecture of Claim 5, wherein said co-processor comprises a content addressable memory.
8. The architecture of Claim 1, wherein said at least two secondary packet processors are coupled with said at least two primary packet processors and operative to share state information.
9. The architecture of Claim 1, wherein said at least two secondary packet processors and said at least two primary packet processors comprise network processors.
10. The architecture of Claim 9, wherein said network processor is capable of bi-directional operation and characterized by a bi-directional throughput, said architecture comprising utilizing said network processor uni-directionally wherein said bi-directional throughput is devoted to uni-directional processing.
11. The architecture of Claim 1, wherein said stateless processing tasks comprise filtering said intercepted packets.
12. The architecture of Claim 1, wherein one portion of said stateful processing tasks comprises inspection and analysis of said intercepted packets and another portion of said stateful processing tasks comprises performing an action on said intercepted packets.

13. The architecture of Claim 12, wherein said action comprises at least one or modifying, deleting, storing information about and releasing said intercepted packets.
14. The architecture of Claim 1, wherein said packet interceptor is capable of interfacing with an optical network.
15. The architecture of Claim 14, wherein said optical network is characterized by compliance with an OC-48 standard.
16. The architecture of Claim 1, wherein said packet interceptor is capable of operating substantially at wire speed.
17. The architecture of Claim 1, wherein said stateless and stateful processing tasks are capable of processing any portion of said intercepted packets.
18. The architecture of Claim 1, wherein said packet interceptor is coupled with said network via a router.
19. The architecture of Claim 18, further comprising a router blade including said packet interceptor, said at least one primary processor and said at least one secondary processor
20. A method of intercepting and processing packets transmitted from a source to a destination over a network, said method comprising:
 - (a) intercepting, selectively, said packets prior to receipt by said destination;
 - (b) distributing said intercepted packets to at least two primary packet processors each operative to perform stateless processing tasks on said intercepted packets;
 - (c) performing said stateless processing task in parallel by said at least two stateless packet processors;
 - (d) receiving said intercepted packets from said at least two primary packet processors by a first secondary packet processor operative to perform a first

stateful packet processing task on said intercepted packets;

(e) receiving said intercepted packets from said first secondary packet processor by a second secondary packet processor operative to perform a second stateful processing task on said intercepted packets; and

(f) releasing, selectively, said intercepted packets.

21. The method of Claim 20, wherein said network further comprises a bi-directional network having an upstream flow and a downstream flow, said method further comprising performing (a)-(f) on each of said upstream and downstream flows independently.

22. The method of Claim 21, further comprising:

(g) sharing state information between said secondary packet processors of said upstream flow and said secondary packet processors of said downstream flow.

23. The method of Claim 20, wherein said at least two primary packet processors are coupled together, said method further comprising sharing data between said coupled at least two primary packet processors.

24. The method of Claim 23, wherein said at least two primary packet processors are coupled together with at least one co-processor, said method further comprising executing a portion of said stateless processing task by said co-processor.

25. The method of Claim 24, wherein said executing further comprises executing a portion of said stateless processing task by said co-processor comprising a classification co-processor.

26. The method of Claim 24, wherein said executing further comprises executing a portion of said stateless processing task by said co-processor comprising a content addressable memory.

27. The method of Claim 20, wherein said at least two secondary packet processors are coupled with said at least two primary packet processors, said method further

comprising sharing state information between said at least two primary packet processors and said at least two secondary packet processors.

28. The method of Claim 20, wherein said at least two secondary packet processors and said at least two primary packet processors comprise network processors.
29. The method of Claim 28, wherein said network processor is capable of bi-directional operation and characterized by a bi-directional throughput, said method comprising utilizing said network processor uni-directionally wherein said bi-directional throughput is devoted to uni-directional processing.
30. The method of Claim 20, wherein said stateless processing tasks comprise filtering said intercepted packets.
31. The method of Claim 20, wherein said first stateful processing task comprises inspection and analysis of said intercepted packets and said second stateful processing task comprises performing an action on said intercepted packets.
32. The method of Claim 31, wherein said action comprises at least one of modifying, deleting, storing information about and releasing said intercepted packets.
33. The method of Claim 20, where (a) further comprises intercepting said packets from an optical network.
34. The method of Claim 33, wherein said optical network is characterized by compliance with an OC-48 standard.
35. The method of Claim 20, said method further comprising performing (a) – (f) substantially at wire speed.
36. The method of Claim 20, wherein said stateless and first and second stateful processing tasks are capable of processing any portion of said intercepted packets.
37. An apparatus for intercepting and processing packets transmitted from a source to a destination over a network, the apparatus comprising:

means for selectively intercepting said packets prior to receipt by said destination;

means for performing stateless processing tasks on said intercepted packets, said means including:

parallel processing means for distributing and processing said intercepted packets in parallel;

means for performing stateful processing tasks on said intercepted packets, said means including:

serial processing means operative to distribute said stateful processing tasks on said intercepted packets and selectively release said intercepted packet back to said network.

38. An apparatus for intercepting and processing packets transmitted from a source to a destination over a network, the apparatus comprising:

a packet interceptor operative to intercept packets from said network;

a packet processor coupled with said packet interceptor and operative to process said intercepted packets; and

wherein said packet interceptor is further operative to filter said packets to determine which of said packets to intercept and said packet processor is further operative to monitor said intercepted packets for pre-defined conditions and at least one of delete, modify and log packets which meet said pre-defined conditions.